ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
UNITED STATES ATOMIC ENERGY COMMISSION
WASHINGTON, 25, D. C.

May 20, 1965

Honorable Glenn T. Seaborg
Chairman
U. S. Atomic Energy Commission
Washington, D. C.

Subject: REPORT ON CAROLINAS VIRGINIA TUBE REACTOR (CVTR) - INCREASE IN POWER TO 65 MW(t)

Dear Dr. Seaborg:

During its sixty-third meeting, May 13-15, 1965, the Advisory Committee on Reactor Safeguards considered the application of the Carolinas Virginia Nuclear Power Associates (CVNPA) to increase the reactor power level of the Carolinas Virginia Tube Reactor (CVTR) from 47.2 to 65.0 MW(t). During its review, the Committee had the benefit of discussions with representatives of CVNPA, Westinghouse Electric Corporation and the AEC Regulatory Staff, and of the documents listed.

During its fifty-ninth meeting, November 12-14, 1964, the Committee reviewed the project progress to that date and reported on the application of CVNPA for a full term license. Therefore, the Committee confined its attention at this meeting to a review of the progress since November of 1964 and to the resolution of any safety questions that might be involved in the increase in power.

The reactor was originally designed to operate at a power of 65 MW(t), but has been operated at a lower power in order to provide experience and conservatism in view of the novel features of this plant. The applicant states that the higher power level proposed will increase linear maximum steady state power output of the fuel from 14 to 17 Kw/ft, and decrease the steady state departure from nucleate boiling ratio from 2.44 to 1.96. The applicant has investigated a number of accidents including loss of flow, loss of coolant, continuous rod withdrawal at power, and introduction of cold water, and finds that the consequences of these unlikely accidents are not substantially increased.

During the early part of reactor operation, the applicant has observed a decrease of about 7% in the coolant flow rate. This decrease in flow has not been explained conclusively and should be investigated further.

An operational problem has arisen in regard to the control rod system. On occasion, control rods have withdrawn slowly without a valid demand signal. This effect might conceivably lead to overheating of a substantial portion of the core. The Committee, therefore, recommends that the applicant provide to the AEC Staff (before any increase in power level is authorized) positive assurance that such an undesired control rod withdrawal cannot occur.

The stepwise method of increasing the power proposed by the applicant should provide adequate protection of the system and sufficient warning of any impending unpredicted behavior. The Committee cautions that enough time be provided at each step to assure that the data collected represent a true picture of the situation and that the data are properly evaluated before taking the next step. The Committee notes that CVNPA intends to continue operation of its continuous leak rate monitoring system. The Committee believes that the operation of this system provides a useful indication of gross containment leakage even though the leak rate accuracy may not be high enough for all purposes.

With the provision that CVNPA provide assurance that the behavior of the control rod system is in accordance with good practice, the Committee believes that this reactor can be operated at power levels up to the design level of 65 MW(t) without undue hazard to the health and safety of the public.

Sincerely yours,

/s/

W. D. Manly
Chairman

References:

1. Amendment No. 22 to CVNPA License Application, dated March 4, 1965.
2. Amendment No. 23 to CVNPA License Application, dated April 15, 1965.